METHOD FOR MATCHING A TWO DIMENSIONAL IMAGE TO ONE OF A PLURALITY OF THREE DIMENSIONAL CANDIDATE MODELS CONTAINED IN A DATABASE

ABSTRACT OF THE DISCLOSURE

A method for matching a two dimensional image to one of a plurality of three dimensional candidate models. The method including the steps of: determining the position and orientation of the two dimensional image; for each three dimensional model, computing a histogram-like table having a computed brightness coefficient for each surface normal of the model based on the corresponding value in the two dimensional image, each brightness coefficient depending only on the corresponding surface normal; and either successively rendering each three dimensional model in the determined position and orientation using the surface normals in conjunction with the corresponding computed brightness histogram-like table; and comparing the two dimensional image with each of the rendered three dimensional models or computing the variance of the brightness coefficients that are used to create each bucket of the histogram-like table, a bucket being a set of similar normal values that are lumped together to form a single argument value in the histogram-like table; computing the sum of the variances of the histogram-like table buckets; and ranking the three dimensional models using its computed sum as an error function, the ranking indicating the likelihood that the corresponding three dimensional model matches the two dimensional image. Also provided is a program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform the method steps of the present invention and a computer program product embodied in a computer-readable medium for carrying out the methods of the present invention.